

2-12 CONSTRUCTION GEOSYNTHETIC

2-12.1 Description

The Contractor shall furnish and place construction geosynthetic in accordance with the details shown in the Plans.

2-12.2 Materials

Materials shall meet the requirements of the following section:

Construction Geosynthetic

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Geosynthetic roll identification, storage, and handling shall be in conformance to ASTM D 4873. During periods of shipment and storage, the geosynthetic shall be stored off the ground. The geosynthetic shall be covered at all times during shipment and storage such that it is fully protected from ultraviolet radiation including sunlight, site construction damage, precipitation, chemicals that are strong acids or strong bases, flames including welding sparks, temperatures in excess of 160 F, and any other environmental condition that may damage the physical property values of the geosynthetic.

Unless specified otherwise in the Plans, the geotextile required for underground drainage shall be “Moderate Survivability” and “Drainage Class C” and permanent erosion control applications shall be “High Survivability” and “Drainage Class C.”

2-12.3 Construction Requirements

The area to be covered by the geosynthetic shall be graded to a smooth, uniform condition free from ruts, potholes, and protruding objects such as rocks or sticks. The geosynthetic shall be spread immediately ahead of the covering operation. The geosynthetic shall not be left exposed to sunlight during installation for a total of more than 14-calendar days. The geosynthetic shall be laid smooth without excessive wrinkles. Under no circumstances shall the geosynthetic be dragged through mud or over sharp objects which could damage the geosynthetic. The cover material shall be placed on the geosynthetic such that the minimum initial lift thickness required will be between the equipment tires or tracks and the geosynthetic at all times. Construction vehicles shall be limited in size and weight, to reduce rutting in the initial lift above the geosynthetic, to not greater than 3-inches deep to prevent overstressing the geosynthetic. Turning of vehicles on the first lift above the geosynthetic will not be permitted.

Soil piles or the manufacturer’s recommended method, shall be used as needed to hold the geosynthetic in place until the specified cover material is placed.

Should the geosynthetic be torn, punctured, or the overlaps or sewn joints disturbed, as evidenced by visible geosynthetic damage, Subgrade pumping, intrusion, or Roadbed distortion, the backfill around the damaged or displaced area shall be removed and the damaged area repaired or replaced by the Contractor at no expense to the Contracting Agency. The repair shall consist of a patch of the same type of geosynthetic placed over the damaged area. The patch shall overlap the existing geosynthetic from the edge of any part of the damaged area by the minimum required overlap for the application.

If geotextile seams are to be sewn in the field or at the factory, the seams shall consist of one row of stitching unless the geotextile where the seam is to be sewn does not have a selvage edge. If a selvage edge is not present, the seams shall consist of two parallel rows of stitching, or shall consist of a J-seam, Type SSn-1, using a single row of stitching. The two rows of stitching shall be 1.0-inch apart with a tolerance of plus

or minus 0.5-inch and shall not cross except for restitching. The stitching shall be a lock-type stitch. The minimum seam allowance, i.e., the minimum distance from the geotextile edge to the stitch line nearest to that edge, shall be 1½-inches if a flat or prayer seam, Type SSa-2, is used. The minimum seam allowance for all other seam types shall be 1.0-inch. The seam, stitch type, and the equipment used to perform the stitching shall be as recommended by the manufacturer of the geotextile and as approved by the Engineer.

The seams shall be sewn in such a manner that the seam can be inspected readily by the Engineer or a representative. The seam strength will be tested and shall meet the requirements stated herein.

2-12.3(1) Underground Drainage

Trench walls shall be smooth and stable. The geotextile shall be placed in a manner which will ensure intimate contact between the soil and the geotextile (i.e., no voids, folds, or wrinkles).

The geotextile shall either be overlapped a minimum of 12-inches at all longitudinal and transverse joints, or the geotextile joints shall be sewn for medium survivability drainage applications. In those cases where the trench width is less than 12-inches, the minimum overlap shall be the trench width.

In moderate survivability geotextile underdrain applications, the minimum overlap shall be 12-inches, or the geotextile joints shall be sewn, except where the geotextile is used in area drains. An area drain is defined as a geotextile layer placed over or under a horizontal to moderately sloping layer of drainage aggregate. For area drains, the geotextile shall be overlapped a minimum of 2-feet at all longitudinal and transverse joints, or the geotextile joints shall be sewn together. The minimum initial lift thickness over the geotextile in the area drain shall be 12-inches.

In all cases, the upstream geotextile sheet shall overlap the next downstream sheet.

2-12.3(2) Separation

The geotextile shall either be overlapped a minimum of 2-feet at all longitudinal and transverse joints, or the geotextile joints shall be sewn together. The initial lift thickness shall be 6-inches or more.

2-12.3(3) Soil Stabilization

The geotextile shall either be overlapped a minimum, of 2-feet at all longitudinal and transverse joints, or the geotextile shall be sewn together. The initial lift thickness shall be 12-inches or more. Compaction of the first lift above the geotextile shall be by Method A according to [Section 2-03.3\(14\)C](#). No vibratory compaction will be allowed on the first lift.

2-12.3(4) Permanent Erosion Control and Ditch Lining

Unless otherwise shown in the Plans, the geotextile shall either be overlapped a minimum of 2-feet at all longitudinal and transverse joints, or the geotextile joints shall be sewn together. If overlapped, the geotextile shall be placed so that the upstream strip of geotextile will overlap the next downstream strip. When placed on slopes, each strip shall overlap the next downhill strip.

Placement of aggregate and riprap or other cover material on the geotextile shall start at the toe of the slope and proceed upwards. The geotextile shall be keyed at the top and the toe of the slope as shown in the Plans. The geotextile shall be secured to the slope, but shall be secured loosely enough so that the geotextile will not tear when the riprap or other cover material is placed on the geotextile. The geotextile shall not be keyed at the top of the slope until the riprap or other cover material is in place to the top of the slope.

All voids in the riprap or other cover material that allow the geotextile to be visible shall be backfilled with quarry spalls or other small stones, as designated by the Engineer, so that the geotextile is completely covered. When an aggregate cushion between the geotextile and the riprap or other cover material is required, it shall have a minimum thickness of 12-inches.

An aggregate cushion will be required to facilitate drainage when hand placed riprap or sack riprap, as specified in Sections 9-13.2 or 9-13.3, is used with the geotextile.

Grading of slopes after placement of the riprap or other cover material will not be allowed if grading results in stone movement directly on the geotextile. Under no circumstances shall stones with a weight of more than 100-pounds be allowed to roll downslope. Stones shall not be dropped from a height greater than 3-feet above the geotextile surface if an aggregate cushion is present, or 1-foot if a cushion is not present. Lower drop heights may be required if geotextile damage from the stones is evident, as determined by the Engineer. If the geotextile is placed on slopes steeper than 2:1, the stones shall be placed on the slope without free-fall for moderate survivability, high survivability, and ditch lining geotextiles.

2-12.4 Measurement

Construction geotextile, with the exception of temporary silt fence geotextile and underground drainage geotextile used in trench drains, will be measured by the square yard for the ground surface area actually covered.

Underground drainage geotextile used in trench drains will be measured by the square yard for the perimeter of drain actually covered.

2-12.5 Payment

Payment will be made in accordance with [Section 1-04.1](#), for each of the following Bid items that are included in the Proposal:

“Construction Geotextile for Underground Drainage,” per square yard.

“Construction Geotextile for Separation,” per square yard.

“Construction Geotextile for Soil Stabilization,” per square yard.

“Construction Geotextile for Permanent Erosion Control,” per square yard.

“Construction Geotextile for Ditch Lining,” per square yard.

Sediment removal behind silt fences will be paid by force account under temporary water pollution/erosion control. If a new silt fence is installed in lieu of sediment removal, the silt fence will be paid for at the unit Contract price per linear foot for “Construction Geotextile for Temporary Silt Fence.”